REMARKS

Applicants submit this Amendment Under 37 CFR 1.114 to support the request for continued examination (RCE) submitted herewith, and to respond to the outstanding final Office Action mailed from the Patent Office on June 19, 2007. To that end, applicants extend their gratitude to Examiner Glass for the indication of the allowable subject matter of claims 29 and 30. Applicants, however, have not rewritten claims 29 and 30 to independent form as suggested, but instead have amended them, and amended the dependency of each to new independent claim 34 instead of claim 1 (now cancelled), as et forth in more detail below.

In summary, claims 1 and 31 are cancelled hereby without prejudice or disclaimer of subject matter, claims 2, 4, 28, 29, 30, 32 and 33 are amended and new claims 34-39 are presented for Examination. A Replacement Sheet is submitted hereby to replace Figs. 2 and 3 as originally filed, as described below. No new matter is entered. Hereinafter, claims 2, 4, 28-30, 32-39 are pending, where claims 34 and 37 are the independent claims. Claims 2, 4, 28, 29, 30 and 32, 33, 35 and 36 now depend from claim 34, and claims 32, 38 and 39 depend from new claim 34.

Response to Drawing Objections

In the outstanding Office Action, the drawings were objected to under 37 CFR 1.83(a). To support the objection, the Examiner asserts that the "predetermined range" must be shown or the features cancelled from the claims.

In response, applicants have amended Figs. 2 and 3, as shown in the Replacement Sheet for Figs. 1 and 2 submitted herewith. With respect to Fig. 2, the Replacement Sheet shows that legends: "PREDETERMINED RANGE;" "Rmot = R + (a-1) R_2;" "R_{mot} = aR;" and $R_{mot} = R + (a - 1)R_1$" are added with arrows clearly indicating which portions of Fig. 2 that the legends describe and define. Legends: "R_1" and "R_2" are added indicating respective points on the abscissa axis of Fig. 2. With respect to Fig. 3, a legend: "PREDETERMINED RANGE" is added along with an arrow indicating breadth of the "PREDETERMINED RANGE" in the figure. Applicants respectfully assert that the drawing figures new comply with 37 CFR 1.83(a), and request withdrawal of the drawing objections thereunder.

Response To Rejections Under 35 USC §112

Claim 1 was rejected under 35 USC §112, second paragraph. In response, applicants have cancelled claim 1 without prejudice or disclaimer of subject matter.

Response To Rejections Under 35 USC §102

Claims 1, 2 and 4, 28, 31 and 33 were rejected under 35 USC 102(e) as anticipated by US Patent No. 4,286,585 to Ogawa. In particular with respect to independent claim 1, the Examiner asserts that Ogawa discloses a hauling unit (Fig. 9, 100) that hauls a subject to bend or rotate the subject, a control unit (Fig. 9, 42, 44, 50) that outputs a control signal corresponding to a target value (Fig. 9, E48) input by an operating unit, and the control unit controls a variation amount of the control signal output in a predetermined range including a position of the hauling unit in a state before the hauling unit hauls the subject to be greater than a variation amount of the control signal outside the predetermined range (col. 4/5, lines 56-68, and lines 1-13, respectively), and a driving unit (Fig. 9, 46 and 40) that drives the hauling unit based on the control signal.

As mentioned above, applicants have cancelled claims 1 and 31, and added new independent claims 34 and 37. Claims 2, 4, 28 and 33 now depend from claim 34. Applicants respectfully assert that new claim 34, and claims 2, 4, 28 and 33 which depend therefrom, are patentably distinct from Ogawa for at least the following reasons.

Applicants intend their instant invention in the claim 34 controller to control a driver unit to effect movement of an actuator mechanism by a hauling unit. The driving unit includes a wire that is wrapped around the driving unit, where the wire ends are connected to the actuator mechanism. The novel controller is instantly responsive to bending control inputs, even where there is improper tension in the hauling unit at the time a user inputs a control, e.g., joystick operation. The intended operation compensates for slack in the wires wrapped around connected to the actuator mechanism. The controller includes a control portion for generating and outputting a driving unit control signal for controlling the driving unit based at least upon one of a first control input signal and a second control input signal.

The controller also includes an input correction portion for converting a externally-supplied target value into a first correction value by a linear converting operation.

A first characteristic curve defined by the first correction value is defined by a first predetermined slope if the received target value is outside a predetermined range within which is indicative of a state wherein both ends of the wire connected to the actuator mechanism are loose. In that case, the input correction portion converts the received target value into a second correction value by a proportional converting operation. A second characteristic curve defined by the second correction value is defined by a second predetermined slope that is greater than the first determined slope if the received target value is within the predetermined range. The first correction value and the second correction value are supplied by the control portion as the first control input signal and the second control input signal, by which the control portion generates and outputs the driving unit control signal to drive the driving unit such that the target value is outside the predetermined range.

In their specification, applicants readily explain this novel operation, including by reference to the legends added to Figs. 2 and 3 (by the Replacement Sheet submitted herewith), by text in their Specification at the paragraph beginning at page 17, line 1 (as amended), by text in their Specification at the paragraph that beginning at page 17, line 15. Applicants' specification discusses the need for such a controller for use in a motorized endoscope in which the wires attached to the actuator mechanism has slack, or are loose. For example, at page 17 applicants state that in a state where wires are loose, even if attempt is made to bend the distal bending section 2 (Applicants' Figs. 1-5) in any of upper and lower directions, the distal bending section 2 is not bent until the motor 9 is rotated to a position where the slack of the wire [in the hauling unit] in that direction is resolved. "

Ogawa is readily distinguishable from the claim 34 controller. Ogawa is intended for the broad purpose of controlling the bending or distal portion, but not in order to improve apparatus responsiveness to user bending command input by addressing the problem of operating the hauling unit in a slack state. Ogawa discloses an endoscope whose distal portion is automatically controlled in order that the distal end portion is always directed to the substantial center of the cross section of a celiac tube, and not press against an inner wall of a colon of a subject under endoscopic investigation. Ogawa indicates that the potential for pressing against the colon inner wall occurs when the insertion portion is bent. Ogawa

includes bend angle control devices and means for controlling the bend angle with a servo motor 40, bending mechanism 48 and bend angle converter 50.

Ogawa's Fig. 9 and referenced text describes Ogawa's bend angle control device 100, including reference signal E42, substantially as follows. Reference signal E42 is derived from reference input generator 42 and provided to difference detector 44. An output difference signal E44 is generated by the difference detector is amplified and supplied to servo motor 40 by as amplified difference drive signal E46. The servo motor drives the bending mechanism 48 based on the magnitude of drive signal E46 and its polarity. A bend angle control signal E48 denotes the angle through which the distal end portion is transmitted to bend angle converter 50. The bend angle converter 50 supplies the difference detector with a comparison signal E50, and subtracts it from E42 in difference detector 44. Difference signal E44 denotes a difference between the reference signal E42 and comparison signal E50.

Ogawa's signal E48 does not refer to applicants' control signal corresponding to a target value, as asserted by the Examiner. And with all due respect, Ogawa's Fig. 9 does not show the operation of Ogawa's hauling units 34, 38, in response to user input, still less how the apparatus is arranged to operate responsively to user input (target value) and haul the object seamlessly even where a hauling unit tension is in a pre-hauling, or non-ideal tension state. That is, even where there is slack in a hauling unit, the instant invention as claimed adjusts for the slack, or tension states in the hauling unit that are not ideal, and accommodates for said tension states in a way that the apparatus appears substantially responsive to the user's target value input.

For that matter, while the Examiner asserts that the variation amounts as claimed are discussed at Ogawa's col. 4, lines 56-58, and col. 5, lines 1-13, the language of newly presented independent claim 34 is believed to clarify the differences between Ogawa and claim 34, which support patentability under Section 102. Ogawa's cited figure and text do not suggest that Ogawa were concerned with slack in its hauling units, overcoming user-input non-responsiveness in such a slack state, or with modifying control signals to maintain user input responsiveness. Ogawa does not teach or suggest a control unit that controls " a variation amount of the control signal output in a predetermined range including a position of the hauling unit in a state before the hauling unit hauls the subject to be greater than a

variation amount of the control signal output outside the predetermined range," as claimed. Nor does Ogawa teach that "the variation amount of the control signal output in a predetermined range" or the "variation amount of the control signal output outside the predetermined range."

New independent claim 34 sets forth a controller for controlling a driving unit for effecting a movement of an actuator mechanism through a hauling unit including a wire wound around the driving unit, wherein both ends of the wire are connected to the actuator mechanism. The controller comprises:

a control portion for generating and outputting a driving unit control signal for controlling the driving unit based at least upon one of a first control input signal and a second control input signal; and

an input correction portion for converting a externally-supplied target value into a first correction value by a linear converting operation, wherein a first characteristic curve defined by the first correction value is defined by a first predetermined slope if the received target value is outside a predetermined range within which is indicative of a state wherein both ends of the wire connected to the actuator mechanism are loose, wherein the input correction portion converts the received target value into a second correction value by a proportional converting operation, wherein a second characteristic curve defined by the second correction value is defined by a second predetermined slope that is greater than the first determined slope if the received target value is within the predetermined range, and wherein the first correction value and the second correction value are supplied by the control portion as the first control input signal and the second control input signal, by which the control portion generates and outputs the driving unit control signal to drive the driving unit such that the target value is outside the predetermined range.

Ogawa does not adjust a control signal for controlling a hauling unit for bending control, and certainly does not adjust such a control signal in varying amounts based on where the control signal lies in a specific predetermined range, which is a limitation included in newly presented independent claim 34, and each of claims 2, 4, 28, 29, 30 32, 33, 35 and 36, which depend therefrom. Applicants respectfully assert, therefore, that

independent claim 34 is patentable under 35 USC § 102(e) in view of Ogawa for at least the reasons mentioned. For that matter, dependent claims 2, 4, 28, 29, 30 and 32, 33, 35 and 36 are dependent from claim 34, and patentable for at least cited for the patentability of claim 34 in view of Ogawa under Section 102. Hence, applicants request withdrawal of the rejection of claims 2, 4, 28 and 33, and to allow each of claims 34, 2, 4, 28, 29, 30, 32, 33, 35 and 36, under 35 USC § 102(e) in view of Ogawa.

Response To Rejections Under 35 USC §103

Claim 32 was rejected under 35 USC §103(a) as unpatentable over Ogawa in view of published patent application 2002/0165432 to Matsui. Claim 32 as amended now depends from newly presented independent claim 37. Newly presented independent claim 37 includes at least the same limitations as included in independent claim 34. Accordingly, newly presented independent claim 37 is patentable for at least the reasons set forth above for the patentability of independent claim 34 in view of Ogawa under section 102. Hence, modifying Ogawa with Matsui as suggested does not remedy the shortcomings of Ogawa alone, so that claim 32 as amended is not unpatentable by the combination of Ogawa and Matsui under Section 103(a).

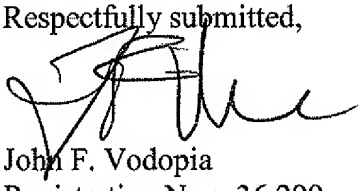
The Examiner is therefore requested to withdraw the rejection of claims 32 under 35 USC 103(a) over Ogawa in View of Matsui.

Conclusion

It follows that each of pending claims 2, 4, 28-30, 32-39, are patentably distinct from Ogawa under Section 102, or Ogawa combined with Matsui under Section 103, and applicants therefore urge the Examiner to reconsider and withdraw the rejections, to allow these claims and pass the application to issue.

If the Examiner believes that a telephone conference with applicants' attorneys would be advantageous to the disposition of this case, the Examiner is asked to telephone the undersigned.

Respectfully submitted,



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Encl. (Replacement Sheet for Figures 1 and 2)